

Effect of Nanoclay on the Morphology of Immiscible Polymer Blends

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Poly(1,4-butylene terephthalate)(PBT)/polyethylene(PE) were prepared by melt mixing of PBT, PE, and organically modified clay. The morphology of PBT/PE nanocomposites with various amounts of clay has been investigated using SEM, TEM, WAXD, and the rheological measurements. For the PBT/PE blend without organoclay, PBT is dispersed in the PE matrix with an average particle diameter below 1 μ m because the viscosity ratio of the PBT and PE is much lower than unity. With a small amount of clay, the domain size of the dispersed PBT phase is significantly increased above 1 μ m. The TEM observations show that all the organoclay is dispersed only in the PBT phase with a high degree of intercalation. The selective localization of organoclay for the PBT phase significantly influences the rheological properties of the dispersed PBT phase during mixing. And then, the viscosity ratio of the PBT and PE phase as an important parameter determining the blend morphology increases. Therefore, the size of the dispersed PBT is increased.